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THE CHAOSMOTIC MACHINES OF DELEUZE & GUATTARI

MASHINES,
PHILOFICTION

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Long-range positive feedback is neither homeostatic, nor amplificatory, but escalative. Where modernist cyber

netic models of negative and positive feedback are integrated, escalation is integrating or cyber-emergent. It is

the machinic convergence of uncoordinated elements, a phase-change from linear to non-linear dynamics. – Nick Land

In his essay *Postskriptum on societies of control*, Gilles Deleuze briefly traces the

transformation of the machine *and* subjectivity in the internal history of capital in three stages, which, however, do not follow a teleological development, but currently present themselves as overlapping “logics” and relations. According to this, the sovereignty societies combine tools such as levers, pulleys and clocks with the sovereign government of the subjects, the disciplinary societies use the energetic apparatuses for the confinement of the subjects, and the control societies functionalize “machines of the third kind” (digital machines) for specific modes of subjectivation, which Deleuze/Guattari call “machinic enslavement”. (Cf. Deleuze 1993b: 254-262/Raunig 2015: 139-140)

Deleuze/Guattari attempt to liberate the machines from their technical cor- sett by transgressing Simondon’s transindividual technical objects a little further. For Deleuze/Guattari, the machines insist on being part of technical, but especially non-technical agents/assemblages that interact with the world as open socio-economic ensembles. The concept of assemblage or agency also has a system-stabilizing component here, insofar as it includes the multiple attributes and properties of networks.

Take a machine that consists of 1000 individual parts and functions with a degree of precision of 1:100000. If one individual part fails in a series of 1000 produced machines, the machines can still be said to be functioning smoothly. However, if you transfer this error quotient to complex machines consisting of 100,000 individual parts, for example, the probability that they will not work is very high. Bahr goes on to point out that the malfunction can no longer be remedied simply by increasing the degree of precision, but only by multiplying functions in such a way that if certain functions fail, other functions have to take over, which in turn requires the production of specific bridging functions. (ibid.: 308). Furthermore, this type of stabilization aims at the production of the machine’s insight into itself, its capacity to produce the corresponding corrections itself, up to its ability to determine the location of the malfunction in its system in order to finally initiate the corresponding repairs.

In *Anti-Oedipus*, Deleuze/Guattari already attempt to conceptualize the difference between the machine as the form of social communication, which under certain circumstances can also manifest itself conservatively, i.e. solely as a technical form of networking, and the tool, the communication-less prosthesis. A distinction is first made between (technical) objects that connect with people to form a mechanical, open whole or a collective, and objects for which this is definitely not the case and which therefore remain “tools”. While the tool functions as a contact carrier, the machine articulates itself as a communication factor; the latter is projective, the latter is recursive. (Deleuze/Guattari 1974: 498) The distinction between the two terms “machine” and “tool” in *Anti-Oedipus* is extended in *Tausend Plateaus* and replaced by four terms, namely the machine by the pair of terms “war machine/working machine” and the object corresponding to this pair by “weapon/tool”. (Deleuze/Guattari 1992: 481ff.) The two machine types are collective agencements that give their statements, relations and technical components a specific functionality. For Deleuze/Guattari, the war machine shapes the object situated in it into a weapon, while the working machine turns the object into a tool. “The relative movement of the tool is formed [...] by linear displacement from one point to the next and the absolute movement of the weapon is formed by the whirling occupation of a space.”

(ibid.:549)

Consequently, Deleuze/Guattari write with regard to the tool: “To become one piece with something else means something fundamentally different from extending, projecting or replacing oneself.” (Deleuze/Guattari 1974: 499) A machine discourse that understands the tool or even the machine as the pro- thesis of the body or cognition, with which the multiplication of forces is to be achieved, is thus invalidated from the outset; as is, incidentally, the cheerful cyber-discourse, which in its technicist configurations of a “human-machine” persistently ignores the social and the economic, or fabulates about an automatic transformation of the social through the technical. According to Deleuze/Guattari, the narrative of the adaptation of the human to the machine as well as the replacement of the human by the machine virtually misses the machine. They write: “It is no longer a question of confronting man and machine in order to assess the possible or impossible correspondences, extensions and replacements of one or the other, but rather of connecting the two and showing how man becomes one piece [a unity] with the machine, or how he becomes one piece with other things in order to constitute a machine.” (ibid.: 498). (ibid.: 498)

The internal syntax of the technical also points to further ruptures and reorientations. Tools or machines whose functions are primarily aimed at material transformations and changes of location are to be distinguished in principle from mechanical apparatuses whose function consists in the creation of measurements and the calculation of quantities. The sorting, measuring, dividing and selecting of quantities requires the storage of forms of movement in material-discursive apparatuses, requires calculations in which subtraction or addition takes place. Beyond devices, apparatuses are to be understood as very specific material-semiotic reconfigurations of the world.¹³⁶ (Barad 2013: 22)

Whether one is able to classify something as a machine or a tool ultimately also depends on whether and how the technical device is used.

The

object becomes part of a machine phylum, which for Deleuze/Guattari is to be understood as a *con-ditio sine qua non* of “machine becoming”. An artifact becomes a machine precisely when it is traversed by a machinic flow of matter, which dissolves a possibly previous segmentation of matter in favour of a molecular relation and distribution in the machinic. This (virtual) “becoming-machine” of the technical object always also means its actualization in a complete structure, its integration into a collective agencement of utterances and content.¹³⁷

The structures of utterance traverse various matrices that can (but do not have to) be discursive and are at the same time part of a machinic order, which also refers to a-signifying semiotics. Agencement inheres operativity (cf. Miyazaki 2013: 20) and thus the “autopoiesis” of the machine, into which various parts are endogenously integrated in order to bring about certain changes in time beyond a teleology. Thus, it can also be said that the functions of the machines always produce further functions, whereby, as Hans Dieter Bahr has emphasized, machines cannot be reduced to sensual objects and functions in the machines can also appear as disturbances or explosive machines that evoke new conjunctions. Deleuze/Guattari write: “But it is the principle of every technology to show that a technical element remains abstract and completely indeterminate if it is not related to a *structure* that it presupposes.”

(Deleuze/Guattari 1992: 549) The vitalism often attributed to authors in this context is once again explicitly rejected by Guattari in his last book *Chaosmose*, when he writes, for example, that for each type of machine the question is not one of its vital autonomy, but first and foremost of its “singular power of enunciation”. (Guattari 2014: 48) Enunciation involves the production, realization and appropriation of utterances by a speaking entity. But the power of enunciation can only articulate itself in a structure of enunciation.

Deleuze/Guattari have developed a concept of the abstract machine in which the machines appear neither as universals nor as ideals; rather, they are to be understood as virtual-real potential machines under the aspect of montage, transformation and the combination of different levels (non-formalized functions and non-formed materials) that traverse the abstract machines. They play a pilot role insofar as they neither precede nor represent reality, but rather construct, stabilize and also destroy it. Deleuze/Guattari write: “An abstract machine in itself is not physical or corporeal, nor semiotic, it is diagrammatic [...]. It acts through matter and not through substance, through function and not through form. [...] An abstract machine is the pure matter-function – the diagram, independent of forms and substances, of expressions and contents that it will disseminate.” (Deleuze/Guattari 1992: 195) At the level of the abstract machine, it is a matter of the combinatorics (de- and reterritorialization) of non-formalized functions and non-formed matter-energies that can actualize themselves in one way or another, as singularities that are not necessarily stable. The abstract machine has the function of operating directly on the level of the material. However, especially in view of a vitalist-inspired materialism debate, of which Deleuze/Guattari are supposed to be the founders, there is no question that the two authors also relate their concept of matter back to socio-economic and political processes, to concrete propositional structures and real machines. Guattari writes: “At the beginning’ of the propositional structures one finds neither the word nor the subject nor the system nor the syntax [...], but one finds elements of semiotization, subjectivation, production of consciousness, of diagrammatism and abstract machines.” (Guattari 1979: 43)

The concept of the diagram cannot be separated from the concept of the abstract machine whose effects Deleuze has described as follows: “(It) incessantly whirls the materials and the functions through each other in such a way that changes are constantly taking place.” (Deleuze 1987: 53).

Accordingly, abstract machines are operative, virtualized and virtualizing models that are always updated in concrete machine structures. They thus enable the respective relations, components and parts of the concrete machines and constitute their temporal processes. From the outset, as Hans-Dieter Bahr has also shown, the machines themselves, taking into account Aristotle’s four causalities (materialis, formalis, finalis and efficiens), do not allow for any unifying descriptions that could point to a naive causality and a unified interaction of the machines. Deleuze/Guattari thus always relate the abstract machines to concrete structures, i.e. they function close to their actualizations and are thus always to be classified historically, whereby the concept of the abstract machine “determines” all aspects of a concrete structure

or, to put it another way, the abstract machine contains the diagram of a concrete structure. “Because a real abstract machine refers to the entire structure: it can be defined as a diagram of the structure. It is not linguistic, but diagrammatic and supralinear. The content is not a signifier and the expression is not a signified, but both are variables of the structure.” (Deleuze/Guattari 1992:127) Abstract machines produce in the virtual mode of montage, with which differences, heterogeneities and intensities are constantly recombined, resulting in actualizations; the abstract here is also to be understood as an extract that is actualized in the singularity of the assemblage, which is always understood collectively. Here, the possible is not understood as a latent actuality, but at the same time always as the impossible that could become real. Machines are never self-contained, rather they maintain (determinate and dynamic) relationships with spatiotemporal exteriorities, as well as with the various universes of signs and the fields of virtuality.

In his book *Chaosmosis*, Félix Guattari outlines a new conception of the machine by first analyzing the most diverse types of machines, whereby their genealogy cannot contain a linear-evolutionistic development from the outset. Guattari demands that in analyzing each individual type of machine, the question of the singular enunciation power of the collective agencements/structures as well as the consistency of the machine's genesis must be addressed.

He first speaks of machine types that are to be understood purely as material devices that are produced by humans or other machines on the basis of plans in order to achieve certain production goals. (Guattari 2014: 48) However, the aspects of assembly and the corresponding finalizations alone, which permeate the respective machine agencements, make it necessary to analyse machine types in their functionalized totality. Within these wholes, a whole series of components must then be considered: material and energetic components, diagrammatic/algorithmic functions (calculations, plans, mathematical equations, etc.), physical components, the factors of affects and cognition as well as individual and collective representations and information, the occupation of desiring machines and the production of subjectivity, and finally the abstract machines that traverse all these heterogeneous components and levels. (ibid.: 48f.) Abstract machines have the function here of producing the extraction of machine levels/components and at the same time their assembly, in order to also connect heterogeneous machine types with one another and give them existence, efficiency and potency. Through the modes of action of abstract machines, the heterogeneous levels of the machinic attain ontological consistency and at the same time the potency for their own stabilization and crises. Guattari calls the resulting dynamic configurations “the machinic assemblage” (agencement), which consists of virtual moments and actualized objects, but without the assemblage ever referring to a concept of genus. In assemblages, even the simplest and most molecular elements acquire the status of a protomachine.¹³⁸

(Abstract machines form neither a mere condition for the economy nor its transcendental horizon, but rather, when they are on this side of the separation of sign and body, expressive structures and forms of content, discursive and non-discursive dispositifs, the sayable and the visible, they are dependent on the economy that ultimately determines them (this is to be understood as a departure from the concept of Deleuze/Guattari). Deleuze/Guattari's concept

of the abstract machine is linked to the analysis of the heterogeneous socio-economic machines that are today part of the expanded reproduction of capital and its abstract, machinic time, and cannot be separated from the concept of machinic surplus value.)

From the outset, abstract machines function as self-referential machines, which, according to Raunig, are characterized by a certain diffuseness, virtuosity and monstrosity. (Cf. Raunig 2015). The diffuseness of the abstract machine refers to its potential to be distributed across the most diverse modes of production and institutions, social, political and economic structures. The virtuosity of the abstract machine refers to abstract knowledge. And the monstrosity of the abstract machine means its possibility as a pure material function, with which it oscillates between propositional structures and matter and thus always holds material optionalities ready. Abstract machines are factors of deterritorialization that lead to morphogenesis.

Terminologically, the concept of the abstract machine initially seems to have more to do with a structure, as formulated by Heinrich Rombach in his structural ontology, than with a (cybernetic) system, but the abstract machine goes far beyond both discourses. Rombach understands the structure as a combination of the inside and the outside, as input and output, whereby it generates both components itself; the structure sets its own target values via various feedback loops and generates and destroys its components and variables itself. (Cf. Rombach 2009) Such structures are usually defined as autopoietic systems that must have certain internal structures with which they can reproduce themselves. (The term autopoiesis was introduced by Humberto Maturana and Francisco J. Varela). For Rombach, a (technological) system functions through the regulation of its variables (temperature, pressure, speed, output, etc.). By presupposing an outside to which an inside corresponds as a target value, it can achieve coherence.

However, the socio-economic machine ensemble also contains political, biological and technical machines and their distributions and is characterized in particular by a much greater flexibility compared to the technical machines, whose elements interlock in a well-defined way according to certain logical, electronic and mechanical links. Such machines overlap the technical machines, which themselves only attain their validity and effectiveness as parts of the socio-economic machines. For Deleuze/Guattari, it is therefore the social machines that assign their meaning and functionality to the technical objects, indeed these are determined by them in the final instance.

4The system here is a cybernetic feedback system: it corresponds to a recursive function between input and output $F = F(x)$. If the system cannot control and balance disturbances in relation to its target value, then the system is simply leaking or doomed to death. (Ibid.)

However, it must be pointed out that Guattari has already presented a completely different conception of the conceptual relationship between structure and machine than Rombach in his text *Structure and Machine*. In Guattari's text, structure is identified with anti-production – with a closed system or a whole of assembled parts functioning via feedback loops, which in

turn is related to other systems. In the context of the totalizing function of the structure, the inputs and outputs then mainly have the function of allowing the respective machine to function according to the principle of eternal recurrence. (Cf. Guattari 2014: 52) For Guattari, on the other hand, the conception of the machine always presents itself as a singularity that cannot be separated from the production of an infinite irruption of the new; the machine marks folding, incision, death, disruption and catastrophe (of the structure) or it carries out the incision or folding – it refers to a radical discontinuity through which the structure is constantly challenged anew or even suspended. (Cf. Schmidgen 1995: 65) According to Guattari, the machines are constantly making cuts or incisions that are always part of their real production, and these cuts could also be understood, with Karen Barad, as foldings, as the dissolution of an ontically and semiotically/semantically figured indeterminacy (within a phenomenon). (Cf. Barad 2013: 35) It is through the incision or the folding-in that the phenomenon first becomes a sign, which does not necessarily tend towards division, but continues to exist in its indivisibility. The incision does not divide anything, but participates in the addition of the open as an opening of its own boundary, insofar as it is exposed to the open space that it interrupts for a moment.

The genealogy of the machines exhibits breaks and transitions, there is imbalance and alterity, which repeatedly throw science and its research teams back to the zero point, but from which new virtual universes beyond equilibrium can also be traced. In this context, Guattari postulates an auto-poietic core of the machine that fundamentally separates it from the structure or the signifier and instead assigns it a fundamental alterity. This creates transitions between the different types of machine, which lead to differential imbalances and the discovery of new virtual universes, and this in the sense of a radical ontological conversion. (ibid.) The alterity of the machine leads to new a-signifying deterritorializations, expressive materials and reference universes that cannot be synchronized at all by the type “structure” and/or by Lacan’s great signifier. The texture of such reference universes, which in the field of music moves from acoustics to polyphony, possesses a unique singularity each time. Guattari writes: “One must take into account that there is a machinic entity that will be embodied in the technical machine, but also in the social, cognitive environment that is connected to this machine – the social complexes are also machines, the body is a machine, there are scientific, theoretical, information machines. The abstract machine traverses all these heterogeneous components, but above all it makes them heterogeneous, without any unifying feature and according to a principle of irreversibility, singularity and necessity.” (ibid.: 54) According to Guattari, the abstract Lacanian signifier can in no way grasp these concrete, heterogeneous structures of utterance; on the other hand, it is also not abstract enough to recognize their respective specificity.

Guattari attempts to apply Varela’s concept of autopoiesis, which remains purely related to living beings, by using this term to describe both human-machine relations and machine-machine relations from the point of view of ontogenesis and phylogenesis, which for Guattari are components of a mechanosphere surrounding the biosphere. First of all, machines are not closed totalities, for they possess determinate and at the same time open relations to spatiotemporal exteriorities, as well as to signs and fields of virtuality. A machine rises to the

surface of actuality as the conclusion of an earlier line of descent and it is the break or the new beginning from which a new line develops into the future. The emergence of such genealogies and fields of alterity are complex. They are continuously revised by the creative forces in science, the arts and other social innovations – areas that are interwoven and constitute the mechanosphere.

If, in phylogenetic terms, these are generations of machines that compete with each other and come into existence through the actualization of virtuality lines, then these processes cannot be integrated into a linear narrative of progress; rather, the machine genealogies take place in the context of heterochronistic rhizomatics. And this also means that for Guattari there is no direct identity between the phylogenesis of technology and the history of production practices and methods. In this context, Guattari refers to the extraordinary example of steam engines being used as children's toys in the Chinese Empire long before they became the first major energy driver of the industrial revolution. (Ibid.: 56) One could add the invention of gunpowder in China, where its importance for weapons technology was not recognized early on. Or the mechanical loom, an invention of the 15th/16th century, which was not used in production until the 18th century. Moreover, scientific and technological development are not identical. There are many factors of radical innovation, invention and the hybridization of different types of machines that can lead to a singularization of machines in history.

On the ontogenetic level, in turn, it can be stated that constant renewals and extended reproductions of individual machines are necessary when factors such as wear and tear, disruption, wear and tear and entropy decompose their energetic, informational and material components and call their functional integrity into question. Scientific and technical knowledge is also subject to this pressure. Both the internal machine alterity as well as the human-machine and machine-machine relations force new specimens or models, so that one can by no means speak of a clearly programmable repetition in the context of an evolution of machines, but rather of a type-technical, collective machinism, which dominated more by the virtual diagrammatics than by the material carriers; there is also a virtual-formal serialization of the machines, in which there is a “certain” loss of singularity. The abstract machine can therefore also be understood as a (transin- dividual) individuation in Simondon's sense, which manages without inputs and outputs and whose diagram inheres an alternation of rupture, erasure and reinvention, with which phylo- and ontogenetic differences are expressed. Guattari writes: “Serialization and loss are correlative to a distancing between the machine manifested in energetic-spatio-temporal coordinates and the diagrammatic machine that develops in deterritorialized coordinates”. (Ibid.: 59) In this respect, the “whole” of a machine is never fully realized, but the abstract machines always remain related to virtualization-actualization-interconnections in the course of an unstable integration of the respective functions. And function is understood here as plasticity within diagrammatic “activities” that can never be fully integrated by material organizations and series.

At this point, Guattari recalls the process of smoothing the materials of a technical machine, whereby the diagrammatic formation of the material takes precedence over the attempt to eliminate the unevenness of the material.¹³⁹ The diagrammatic formation (qua types, forms

and numbers) integrates the concrete-material states of the machine and smoothes them. This is a process of deterritorialization that concerns both the normalization of materials and their digital availability. At this point, Guattari cites the example of the relationship between a key and a lock, in which the contingent material configurations, which must fit together, are overdetermined by the diagrammatics of forms that contain all the profiles of the lock and the key. The integral diagrammatics here smoothes out the material forms in a deterritorialized mode, whereby this operation.

The “digital and functional aptitude” (ibid.: 60) of the machine, however, also requires very specific materials that, as imprints, must satisfy the formal requirements of diagrammatic plans. Guattari writes: “The components of the technical machine are thus like coins of a formal currency, which has become more evident since their computer-aided planning and production.” (ibid.: 61) Nevertheless, in the processes of smoothing, there is no hegemonic establishment of a pre-stabilized diagrammatic order – as far as both the inter- and intra-relations of the machines are concerned – because the diagram itself must be understood as an unstable autopoietic machine, and this not only with regard to the material and functional consistency of the machines, but above all with regard to the question of a necessary coupling of the machines to various alterity registers, to virtualities that point beyond the existential territoriality of the machines.

The machine is therefore less to be defined by what it is, by its closed structure, but rather indicates a shift towards what a machine does or can do on different levels. This requires not only a discussion of its tendencies or its virtualities, which in turn are individualized or actualized through certain activities, but also the inclusion of the dimension of its dissolution. Nowadays, machines rarely break down for natural reasons, as can be seen from the fact that, despite their material robustness, machines are becoming museum pieces at ever shorter intervals because they are economically unprofitable.

Machine configurations, structures and assemblages exist in incorporeal reference universes (alteration domains), in certain fields of alterity that demonstrate the possibility that the machines can open up or transition into open fields. Guattari subsumes the following relations under machinic alterity registers: 1) Relation between the different machines and between the parts of the same machine. 2) Material and diagrammatic consistency. 3) Evolution of the material phylum. 4) Agonistic war and autoagonistic desire machines. 5) Fractality and scale. (ibid.: 62) However, the various registers of alterity that can be found in the constellations of incorporeal reference universes cannot be fitted into a narrow classificatory scheme; rather, they are characterized by a potentially infinite capacity for transversal combination. For Guattari, this ability definitely goes beyond the organization of the various levels of functional integration and the interactions between the machines, when the machines intervene in the various registers of alterity in order to manipulate them. The dominance of the virtuality of the machines over their materiality, which is itself already an ensemble of different organizations of the material, is characterized by the fact that the machines inherent in the construction of universes of value that emerge above all from the machine-machine relations themselves (technology, economy, music, biology, etc.).

In terms of their ontological status, machines are always to be understood as consistencies and multilinear universes, which Guattari attempts to illustrate using the example of the French passenger airplane Concorde. This aircraft stands at the intersection of the following universes: 1) Diagrammatic and plans of what is feasible. 2) Technology and material realization. 3) Industry and the actual realization of the machine through loans, the state and its provision of research and development funds. 4) Imaginary universes that represent desires. 5) The desire that the state and the economy provide the financial means for realization. (Ibid.: 66) Even the failure of one of the components can ultimately lead to the project either not being realized or at least not appearing to be economically viable. At this point, Guattari once again decisively opposes the hegemony of the Lacanian signifier when he points out the impossibility of subjecting the heterogeneous universes of reference to a general uniformity and translatability.

Maurizio Lazzarato is certainly right when he writes in his latest book *Signs and Machines* that contemporary critical-physiological theory (Badiou, Negri, Butler, Žižek, Rancière, accelerationists, etc.), in the course of its entrenchment in the hegemonic linguistic discourse, ignores issues such as the specific socio-economic operations of machines, machinic enslavement and a-signifying semiotics.

4The wide range of left-wing authors continue to place the emphasis on analyzing the semiologies of signification in relation to the problems of the financial functioning of capital, the machinic/technological and subjectivation. And this is all the more astonishing given that today a myriad of machines, which can certainly be described as constant social capital, have long since taken over our everyday lives by more than just assisting our modes of perception and affect, our cognition, but also increasingly controlling and regulating them. (Lazzarato 2014: 13) The authors mentioned above thus continue to stubbornly ignore the significance of a-signifying semiotics, although it is precisely these in the context of a machinic appropriation that still work through the discourses, functions and significations in and with which individuals recognize themselves and shape their own reality by also giving the significations a new form.

Guattari makes a strict distinction here between semiology, semiotics and coding. (Cf. Guattari 2014: 67): Firstly, he mentions the coding of the natural world and biology. Secondly, Guattari distinguishes between two semiological categories: on the one hand, the prescriptive semiologies (shouting, whispering, crying, etc.) with the apparent predominance of spoken language and, on the other, linear structural signification. The signifying semiology produces consistent sentences, statements, meanings and representations through language in a variety of discourses and narratives. Guattari subsumes the signifying semiologies (which also include computer science) in particular the letter fonts, which homogenize the polyvocality of the presignifying semiologies (non-linguistic signs such as gestures, facial expressions, tattoos, etc.) in a possibly despotic way within the framework of a dominant communication economy.

Thirdly, Guattari separates the *a-signifying* semiotics (algorithms, mathematical calculations, diagrams, indices, plans, notations, affects, etc.) from the codes and semiotics, which today play an important role in information technologies, economics, science and art in particular.

Guattari has the a-signifying semiotics against the concept of ideology, whereby they are by no means to be understood as part of the “ideological state apparatuses” (Althusser), whose semiologies of signification and interpretation involve dual subjectifications (man/woman, ego/other, economic subject/citizen, etc.). In the experimental sciences today, the manipulation of matter through diagrams predominates, insofar as these offer a terrain “where signs exert a direct effect on things” (Guattari 1977: 303). This concept of diagrams feeds on the attempt to find approaches to the world other than purely linguistic ones, in order to finally escape the hegemonic Lacanian dictum that the unconscious is structured like a language. In contrast to Lacan’s thinking, a multitude of semiotic processes must be referred to here, which do not necessarily all have to be language-based and which are always differentially effective on different levels (macro, meso and micro levels). These modes of difference and interference function neither purely inductively nor purely deductively, but rather, as Charles Sanders Peirce put it, abductively. This refers to an unstable and revisable mode of inference that includes error-relevant rules that are necessary for the construction of dynamic systems and complex organizations. In contrast to Peirce, Guattari excludes the image of a-signifying semantics and emphasizes that the latter are mainly coding, algorithms and diagrammatics, which, however, and this must be added, are often represented with graphically and tabularly dominated sign systems. Thus, the machines of contemporary financial capital often inaugurate operations, strategies and practices that are based on a-signifying semiotics. The a-signifying semiotics – part of the socio-economic and/or technological machines – can thus by no means be reduced to symbolizations, to language and its representations. On the contrary, they themselves “constitute” the inputs and outputs of the machine processes by entering into machine systems as digital programs and being part of the outputs as states of order. A-signifying semiotics work like and as material cogs in the machine complexes. Under certain circumstances, they copy into the machines a reader, interpreter or moderator into the machines, and in doing so they do not address the ego of an individual, but rather set operations in motion that are aimed at the pre-individual unconscious, indeed directly at the neuronal of individuals. Mathematical models, algorithms, computer languages and diagrams – they all participate not only in the processes of subjectivization, but also in the creation of objects; they interact directly with material flows by making technical machines such as computers function in the first place, while as monetary signs they incessantly activate the monetary capital flows of the economy. They therefore do not work at all on the level of social representation and do not produce any concrete meanings, but rather involve modes of far more abstract deterritorialized semioses, such as those found today in the various scientific, economic and technological fields. This is a purely operational production of meaning or a production of meaning without any concrete meaning (although a-signifying semiotics must mean a-signifying semiotics). Through and with the a-signifying semiotics, the machines act (actions on actions) and “speak”, they produce real phenomena (materializations across space-times) continuously and discontinuously by means of material/non-discursive practices, in order to make certain indexations of capital effective and to carry out the evaluation and control of various differentials of capital and money, while the mechanisms of language in turn serve to reterritorialize the flows of capital decoded qua a-signifying semiotics with their representations. Signs and semioses thus operate today as parts of two heterogeneous and at the same time complementary logics/machines.

Deleuze/Guattari also speak with regard to the economic math, whose most important operator is still money (price form), of a-significant semiotics that connect the various human agents, their organs and their perceptive systems directly with the economic machines and their procedures and signs. Here, the human and non-human agents function as moving parts within the material practices and connectivity of rhythmized flows of monetary capital that both converge and diverge in machinic networks.

Money, stock indices and unemployment statistics, algorithms and scientific diagrams, formulas and models, functions and computer languages – they all produce neither discourses nor narratives beyond signification (language, writing) as a-signifying semiotics, rather they operate and multiply the productive forces of the machinery and its networks in an abstract-mathematical, algebraic or stochastic mode of economic semiosis.

In the differential machine complexes of capital, which today often function diagrammatically in order to produce financial, recombinant or machine surplus value, agents are no longer constructed as purely subjective and semiotics can no longer be understood as representational. If the subjects lose their subjectivity to a certain extent with their subsumption under the functionality of the machines, then the technical objects/events lose their objectivity – subject and object become vectors of a monetary capitalization that can no longer be decoupled from their diverse and differential machinic-semiotic apparatuses and processes.

Deleuze/Guattari's concept of machinic enslavement captures machines as networks whose (human and non-human) components, molecular variables and relations are radically subjected to a new governance, i.e. a mode of functional control and digitized regulation by capital. Of course, the machine functions most effectively as a self-regulating, autopoietic machine, as the permanent folding-in of materializations, discourses and semiotics, i.e. through cuts, whereby the machines are always coupled to other machines. In this respect, the connection is also to be understood as an effect of the machinic functionality itself, which has to provide both the respective modeling of the material for interfacing and the corresponding interoperability of the machines.¹⁴⁰

In complete contrast to the homogenization of the various alterity registers of the machine, the libertarian consistency of a machinic agent, as imagined by Guattari, is demonstrated precisely by the fact that machines differentially traverse various levels and thresholds, “thresholds of non-linear irreversibility, ontogenetic and phylogenic thresholds, thresholds of creative heterogenesis and creative autopoiesis.” (Guattari 2014: 69) When Guattari speaks of fractal machines at this point, he is alluding, like Laruelle, to a force of irregularity that in itself makes the given irregular. (Cf. Laruelle 2014: 115) This force is added to the completed real in order to stage a polyphonic, a non-linear process existence, which repeatedly tears the virtual structure out of the actualized spacetimes. When Guattari cites existential machines at this point, which must always be reinvented, but at the same time have always been there (given-without-given), this could also be interpreted in the direction of Laruelles theory.

Concepts, semiotics, rules of manipulation and function cannot easily be transferred from one level to another if there is discontinuity between the different levels. The criterion of classification of these different organizational levels is usually the scale or scale at which the particular phenomenon is active. Physical phenomena or material configurations of different scales are complex and therefore cannot be easily translated into one another. This requires autonomous attempts at explanation on the respective levels and their subsequent integration. In the context of the machine processing of capital, however, it is still important to keep the respective parts, levels and segments of the machine semiotically compatible; ultimately, they must be subjected to a standard and a format.

Conjunction and connection are two different modalities of machinic linkage. At this point, the categorial status of the interface, a location that can hardly be localized, an ontologically unfixable relation of attributions, metaphors, properties and references, which are inherent to the operational functioning, must also be taken into account. (Cf. Tholen 1999: 100) Thus the digital-discrete mode of calculation today makes the various parts of capitalist production compatible as a predetermined standard (of capital), although the specific syntax of the respective operating system and its levels must always be recognized – in the most effective case, however, there are no ambiguities or nuances to report in the machine processing of capital. This constantly undermines the transversal character of the multifunctional and multidimensional levels of the machine.

It can be read as a remark that the real, which is the immanent cause of force, does not mix with the fractal force, and at the same time the latter is not absorbed into the given material. However, Laruelle's emphasis is on an intrinsically identical real that is not identical with the machinic (existential) reality, whereas Guattari, on the other hand, emphasizes a non-identical, polyphonic virtual being whose virtual compositions, which can be now and tomorrow, there or then, are actualized in complex textures. While Guattari emphasizes radical difference with machinic alterity, Laruelle focuses on the axiomatic exploration of the insufficiency of identity or the collectivity of the machine, which always also requires fractal force.

With Deleuze/Guattari, it can thus be said that the a-significant semiotics in the field of the economy of capital are not language-centered dispositives that serve the reproduction of ideology, for example, but rather more abstract modes, binary or probability-oriented codes. On the one hand, the algorithm (of capital) does not directly calculate particular works down to averages (average profit rates), but it calculates with the signs of the code that produce the average, average profit rates, i.e. neutralize the particular works to homogeneous representations (abstract works). This is the aspect of the past. On the other hand, a-significant semiotics operate with signs (of capital-power) that do not represent anything, but rather anticipate, produce, calculate, compute and shape something. As signs of power, think of the capitalization form, they permanently open up the game with the future. It is now immediately apparent that the a-signifying signs support the economy of virtualization/actualization restrictions, because they open up a scope for future options; they serve to calculate the future in terms of capital-compliant exploitation. Beyond the technological

apparatuses, the socio-economic machines of capital are to be understood as both material and semiotic insofar as they include agencements that operate in the context of virtualization-actualization-interconnection (synchronous and diachronic). Their visible dimension (apparatuses and diagrams, equations, plans, etc.) is always linked to a virtual dimension that contains the gradual differentiation of the series of past machines (past, but never finished) and at the same time the series of infinite, future machines that will or will not be actualized in the future. In this respect, the future is already a participant in the configuration of material-discursive and semiotic processes, their structuring and restructuring. The diagrammatics of the machines are thus intersected by the current/virtual dimension, insofar as the machines themselves exist at the intersections of the series of past machines and the infinity of machines that are yet to come.

For Deleuze/Guattari, capital appears first and foremost not as a linguistic, but primarily as a semiotic operator (whose regularity and differences are in turn to be determined). The processes of diagrammatization imply seamless transitions from one state of reality to another (Guattari speaks here of transduction). Here the separation of signifier and signified, of matter and semiotics and even that of language and representation begins to become blurred. Similar to Karen Barad's concept of the dynamics of machine intraactivity (cf. Barad 2012: 41), machinic agencements and the associated a-significant semiotics indicate that sign practices are always already material (as are discourse practices, by the way), in that they configure phenomena (instances of wholeness) and processes in which the externality between matter and sign is no longer constitutive, but rather both factors are mutually included in the dynamics of machinic transduction.¹⁴¹

(With reference to the theories of the quantum physicist Niels Bohr, the postfeminist Karen Barad develops an interesting theory of scientific-experimental apparatuses from his point of view by detaching Bohr's philosophical-ontological approach from the field of theoretical physics in order to discuss it for the analysis of techno-scientific, feminist-queer and economic practices. Barad defines apparatuses as material-discursive practices that produce a specific phenomenon (objects in the context of instances of wholeness) and are also part of it. The technical means – physical boundaries as well as systems of expression – are not predetermined by the apparatuses, but are only produced by them.)

Without the integration of a-signifying semiotics, the various material-discursive processes of the economy simply cannot function today; semiotics transcend the boundaries of the various types of signs and combine them with various materials when they come into effect and function in the productive machines of the economy. The fact that the boundaries between production and representation become permeable qua interventions is a decisive strength of a-signifying semiotics: they integrate different forms of evaluation and measurement (capitalization) and homogenize the heterogeneous areas of asymmetrical power relations by integrating them into the accumulation of capital. A-signifying semiotics, insofar as they concern the economic mathematic, are to be understood as parts of the flows of money capital, which in a certain way remain indifferent to the contents, the specificity of production and the subject. These are non-figurative, disruptive and rhythmized flows that ultimately give

rise to any kind of production, whereby today it is financial capital that ultimately modulates the frequencies, amplitudes and scales of investment and speculation of the capital machines in order to be able to initiate any kind of production in any sector in principle. Accordingly, both the (incorporeal) representations and the a-signifying semiotics associated with the current financial instruments (derivatives) are to be understood as active modes of function and operationalizations of digitized capital, because they serve the organization of capitalist power; that is, the financial exploitation processes designed in this way not only include the realization of the prices of derivatives in the course of the multiplication of money capital, but, insofar as they are articulated in linguistic representation and a-significant semiotics, they play an active role in the reproduction of capitalist power relations and their operational modes.

They are practices that define what is extracted from an ontic-material zone of indeterminacy and can thus be materially counted, i.e. measured. Matter thus does not represent something supra-historically given, but is conceived as always in the process of becoming. It is created through intra-action in the world, and for Barad this points to a weak realism.

Of course, it should also be mentioned that Guattari's schizoanalytic cartography is an attempt to show qualitatively very different processes of subjectivation by providing the *per se* restless and apersonal desire with a cartography of the entrances and exits of the flows as well as the lines of flight for creation and deterritorialization, which the state apparatuses and capital always attempt to block, namely through the stratification or rejection of all possibilities that keep the creation of the new open. For Guattari, the abstract arts, the way in which they emphatically welcome the process of creation without pursuing any particular goal, offered the most promising model for his own cartographic project.

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Now a word on Deleuze/Guattari and their relationship to quantum theory, although both authors make fewer explicit statements on quantum theory than Baudrillard or Laruelle. One could start with their concept of chaos. With its mathematical structure, the classical theory of chaos, which is described as "deterministic", leads to the system figuratively "sitting like a grain of sand on a knife edge" at a bifurcation point – and such a state with an exact location – precisely at the bifurcation point – and an exact speed of zero according to Heisenberg's indeterminacy relation never exists in nature. So if classical physics with its mathematics predicts something that cannot exist, quantum theory must intervene to correct it.

Deleuze/Guattari define chaos less by its disorder than by the infinite speed with which every form and movement in chaos takes shape and disappears again. "It is a void that is not nothing, but a virtual that contains all possible particles and produces all possible forms that only appear to disappear again immediately, without consistency or reference, without consequence. Chaos is an infinite speed of emergence and disappearance. (Deleuze/Guattari 1994: 250) This refers to the virtuality of thought in art, philosophy and science, but it can also be related to quantum field theory, to the concept of the virtual creation and annihilation of particles from the vacuum, a sea of energy, an image that can be linked to Deleuze/Guattari's

image of chaos. The virtual is a form of the real that ultimately always eludes thought and thus never becomes real: It is real without being real. Consistency and openness in creation and annihilation are never to be understood here as absolute concepts. In the world there is no absolute consistency in the sense of pure order, just as there is no absolute indeterminacy or openness in the sense of pure randomness or noise. These extremes are the phantoms of Platonism, stoking the fear of entropy and disordered chaos to justify hard alignments. However, chaos in Deleuze/Guattari and in quantum field theory also differ. In the latter, the speed of all processes in question is finite and limited by the speed of light in a vacuum. Deleuze/Guattari's appeal to infinite speed refers first of all to the speed of thought and can be linked to Feynman diagrams, which, according to Deleuze/Guattari, represent the actual processes of virtual creation and annihilation of particles in quantum field theory to a certain extent. At each point of the processes represented by a particular Feynman diagram, another virtual process can occur and thus another diagram can be inserted, leading to an infinitely extensible topological structure. Feynman diagrams are diagrams that help us to visualize a situation at least heuristically, or, to put it differently, to slow down the phenomenological chaos of the situation in order to keep representations in memory and support computations. What actually happens at the real level of such processes is equally impossible for us to know, let alone visualize.

(Quantum field theory entails higher epistemological and conceptual complexities than quantum mechanics or even classical physics. However, in string theories it can lead back to a more classical and conceptual view, for example to a more classical and above all more vivid picture of an underlying order).

Quantum field theory makes it possible to combine the concept of the virtual in chaos with the idea of chaos as the unthinkable. This connection arises from the possibility that the processes responsible for the creation or destruction of forms, for their emergence and disappearance, or for the speed of both, are ultimately unrepresentable with the means at our disposal. At this point, Deleuze and Guattari refer to black holes, the ultimate nature of which eludes our understanding.

Another concept of chaos, namely that of disorder, which is determined by the role of chance in its workings, must also be considered here. Deleuze/Guattari do not completely deny the concept of chaos as disorder. While chaos may not be defined so much by its disorder (as by infinite speed), it may be defined at least in part by chance. Since all our knowledge of nature can only be formulated statistically, chaos comes into the picture as chance and disorder. The character of chance in quantum physics is irreducible in terms of an underlying or hidden necessity of the ultimately unknowable and even unimaginable nature of quantum objects and processes as seen or idealized by quantum theory. There is no principled knowledge that would allow us today or ever to eliminate chance and replace it with the image of necessity that underlies it. But neither can we postulate a causal dynamic as unknown or even unknowable that exists in and of itself outside of our engagement with it. This restriction is crucial, since some forms of the classical understanding of chance allow for this kind of (realist) assumption. (Plotnitsky 2006b)

Moreover, the fact that in both quantum mechanics and quantum field theory, at least in the

concept of complementarity, the “ultimate” objects and processes cannot be recognized, let alone visualized, implies the essential existence of chaos as the unthinkable. Chaos as the unthinkable and chaos as chance or disorder are part of the new concepts of quantum theory or part of the chaosmos, to use a formulation by James Joyce or Deleuze/Guattari. In quantum field theory, these two concepts of chaos are favored because they are the only way to deal with chaos and to build the physical and mathematical architecture of quantum field theory. To accomplish this task, however, quantum field theory is forced to continue to deal with chaos as the virtual (virtual particles and voids), combining the image of chaos as the unthinkable and chaos as chance. Quantum field theory takes the concepts of chaos as the unthinkable and chaos as chance and disorder from quantum mechanics, but adds the concept of chaos as the virtual. (plotnitsky 2006b) The concept of virtual particle formations and thus the role of the chaos of the virtual thus remains important for quantum field theory. Accordingly, the self-consistent generalizations about chaos as chance and chaos as the unthinkable, and in the case of quantum field theory about chaos as the virtual, constitute what quantum theory tells us in an approximation about nature. In other words, chaos as the virtual belongs to the scientific thinking of quantum field theory, while chaos as the incomprehensible and chaos as chance also belong to nature in the (chaotic) order of quantum mechanics.

Plotnitsky cites quantum electrodynamics within quantum field theory. An electron and a positron (anti-electron), a photon, an electron-positron pair can be found in the field, whereby only probabilities for movements can be correctly predicted by quantum field theory, which makes chance and chaos as chance unavoidable. The result is that in quantum field theory, the study of a particular type of quantum object (e.g. electrons) involves not only other particles of the same type, but also other types of particles, possibly all existing types of particles. It is as if instead of an identifiable, moving object, as studied in classical physics, there is a constant appearance and disappearance, creation and annihilation of particles from point to point, so-called virtual particle formation. Although such events are possible in principle and their possibility defines the situation and what can and cannot actually happen, only some of them can be registered. Usually, those particles that are registered by observations are called “real particles”, while those that are not registered are considered “virtual particles”. The corresponding quantum field theoretical physical concept has a mathematical and experimental rigor specific to science, but retains the central philosophical conceptual architecture of the virtual. (Plotnitsky)

A further starting point at which Deleuze/Guattari dock onto quantum theory is the term of the plane of immanence. It is pre-philosophical insofar as Deleuze/Guattari consider it relatively separately from the concepts. Concepts can be understood as several waves that rise and fall, but the plane of immanence is the only wave that rolls concepts up and down. Thus, in this concept, philosophical thinking is illustrated as a particularly structured wave process. Non-philosophy is located where the plane of immanence confronts chaos. Philosophy needs a non-philosophy that understands it; it needs a non-philosophical understanding, just as art needs non-art and science needs non-science. The plane of immanence, which, according to Deleuze/Guattari, was invented by Spinoza, is that which must be thought and that which cannot be thought. It is the non-thinking in thinking. This

opens up an analogy to the level of quantum mechanical thinking, whereby the latter here has to be philosophical rather than physical. The ultimate nature of quantum objects such as electrons and photons must be thought and yet cannot be thought through quantum theory.

The plane of immanence is also responsible for the non-localizable interferences that are referred to as bringing in what must be thought and yet cannot be thought. To this we might add that Heisenberg's and Bohr's thinkable quantum objects are non-localizable interferences that are themselves quantum-like. But we cannot describe or even comprehend the ultimate nature of quantum objects, even though we have to work with these unimaginable objects that must be thought and cannot be thought. One could also add the undecidability of certain mathematical propositions in mathematics, i.e. propositions that cannot be proven true or false using a system of axioms in which they are formulated (although some of them can be considered true). Gödel was the first to prove the existence of such theorems in most functioning mathematical systems. He also proved that the statement that such a system is consistent is also undecidable, so the consistency of most mathematical systems cannot be guaranteed. Gödel's undecidability could have influenced Deleuze/Guattari's thoughts on the unconscious. The idea of undecidability arises through an interference between philosophy and mathematics. Mathematics with its immanent axioms does not represent objects, but formalizes and symbolizes connectivity in the medium of truth in the sense of Luhmann.

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